

Additive Manufacturing of Low Work Function Oxides for Spaceborne Thermionic Emission Applications

Completed Technology Project (2017 - 2021)



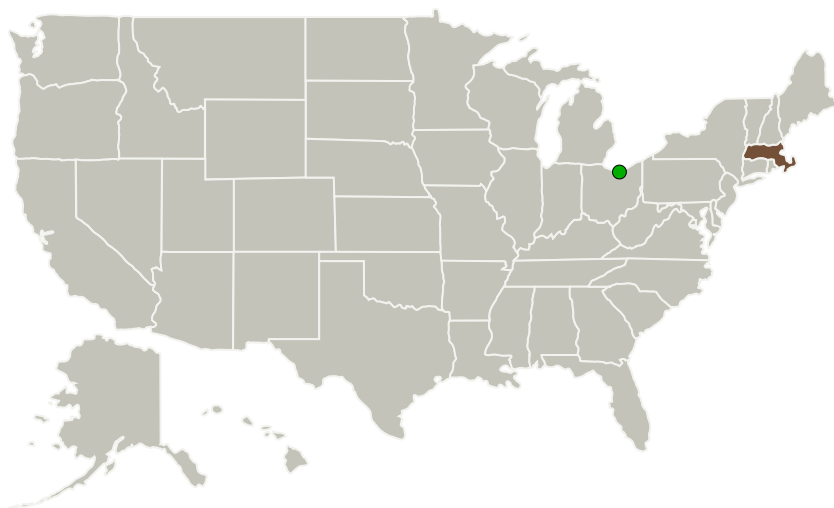
Project Introduction

The purpose of this project is to develop an additive manufacturing process for the fabrication a material for use in thermal management of high-speed vehicles, energy conversion, and electric propulsion. To accomplish this objective, the material will be characterized and an additive manufacturing process will be selected and developed, resulting in the creation of a new additive manufacturing machine for ceramic-metal composites. Furthermore, an attempt will be made to synthesize and fabricate the materials through a single-step additive manufacturing process, reducing the manufacturing time of the material. The research is directly aligned with NASA's mission to develop novel materials and manufacturing systems for aerospace applications. Furthermore, the applications enabled from the manufacturing of this material will be beneficial to thermal protection, electric propulsion, and energy conversion systems.

Anticipated Benefits

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Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Massachusetts Institute of Technology(MIT)	Lead Organization	Academia	Cambridge, Massachusetts
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Massachusetts

Project Website:

<https://www.nasa.gov/strg#.VQb6T0jJzyE>

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Massachusetts Institute of Technology (MIT)

Responsible Program:

Space Technology Research Grants

Project Management

Program Director:

Claudia M Meyer

Program Manager:

Hung D Nguyen

Principal Investigator:

Anastasios J Hart

Co-Investigator:

Daniel Oropeza Gomez

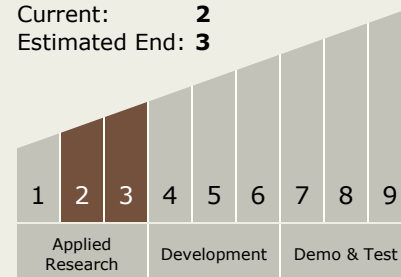
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Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **3**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes

Target Destination

Earth